IMPACT OF OUT-PATIENT CARDIAC REHABILIATION ON DEPRESSION AND QUALITY OF LIFE AFTER CABG.

Dissertation submitted to

The Tamil Nadu Dr. M.G.R. Medical University

Chennai

In partial fulfillment of the requirements for the degree of

MASTER OF PHYSIOTHERAPY

(PHYSIOTHERAPY IN CARDIO-RESPIRATORY)

Reg. No. 271730001

May – 2019

COLLEGE OF PHYSIOTHERAPY
SRI RAMAKRISHNA INSTITUTE OF PARAMEDICAL SCIENCES
COIMBATORE – 641044

CERTIFICATE

This is to certify that the dissertation work entitled **"IMPACT OF OUT-PATIENT CARDIAC REHABILIATION ON DEPRESSION AND QUALITY OF LIFE AFTER CABG"** was carried out by the candidate bearing the bearing **Register No.271730001(May 2019)** in College of Physiotherapy, SRIPMS, Coimbatore, affiliated to the Tamil Nadu Dr. M.G.R Medical University, Chennai towards partial fulfillment of the **Master of Physiotherapy (Cardio-respiratory).**

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

Place:

Date:

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"Sab Dharti Kagaz Karu, Lekhan Sab Ban Raye,
***Sath Samundra Ki Mas Karu, Guru Gun Likha Na Jaye."* – kabirdas**

"Even if the whole earth is transformed into paper with all the big trees made into pens and if the entire water in the seven oceans is transformed into writing ink, even then the glories of the Guru cannot be written. So much is the greatness of the Guru."

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ABBREVATIONS

- WHO - World Health Organization
- CABG - Coronary Artery Bypass Graft
- CAD - Coronary Artery Diseases
- PTCA - Percutaneous Transluminal Coronary Angioplasty
- CR - Cardiac Rehabilitation
- HRQoL - Health Related Quality of Life
- BDI - Beck Depression Inventory
- SF-36 - Short Form-36

Abstract

ABSTRACT

Background

Depression following major cardiac events is associated with higher mortality and also affects the quality of life after coronary artery bypass graft surgery but little is known about whether this can be reduced through treatment including cardiac rehabilitation.

Aim

To evaluate the role of cardiac rehabilitation in depression and quality of life after Coronary artery bypass graft surgery. These two entities are associated with worse outcomes after coronary artery bypass graft surgery.

Methods

We enrolled 30 subjects who underwent coronary artery bypass graft. They participated in an 8week cardiac rehabilitation. Patients were personally interviewed for the assessment of depression and quality of life. The patients completed Beck's depression-II (BDI-II) and SF-36 Form before and after the rehabilitation.BDI and SF-36 scores were recorded and the changes in the scores were compared using paired t- test p values <0.005 were considered statistically significant. Correlation between the variables using Pearson correlation.

Results

BDI-II scores decreased (M-14.87$\pm$7.77) with participation in the rehabilitation (11.50$\pm$5.44 t-4.94, p value>0.0001). Mean of SF-36 form components physical functioning, role limit due to physical function and social scores increased with the participation (20.13$\pm$1.59 to 24.93$\pm$1.36 t-10.64 p value- 0.0001,6.07$\pm$1.34 to 7.0 $\pm$0.84 t-4.24 p-0.0002,5.07$\pm$1.20 to 6.07$\pm$0.48 t-7.18 p<0.0001). But no significant improvement seen in emotional well being. There was a positive but weak correlation between depression and quality of life after CABG (r =0.0462).

Conclusion

Cardiac rehabilitation decreases the levels of depression and improves the quality of life in patients after coronary artery bypass graft. These patients may benefit from this rehabilitation and therefore, may cope up well with the new changes in their health conditions.

Key words*: depression, quality of life, coronary artery bypass graft, cardiac rehabilitation.*

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CHAPTER 1

INTRODUCTION

1.1 THE BACKGROUND

Cardiovascular diseases are the most common cause of mortality worldwide, and coronary artery diseases are the most common among all cardiovascular illnesses. They accounted for 50% of deaths in developed countries and each year many people die due to lack of treatment or suffer from related chronic disabilities [1.]

Coronary artery disease causes arterial stenosis, compromises blood circulation to the myocardium, and leads to ischemia and infarction because of the build-up of unnatural lipid, fat and fiber in the vessel wall. Treatment methods for coronary artery disease consist of angioplasty, drug therapy, stenting, atherectomy and surgical treatments such as coronary artery bypass graft (CABG) surgery [1.]Coronary artery bypass graft surgery (CABG) has been identified as an important surgical tool in the treatment of CAD and has been used for nearly 50 years. CABG surgery substantially improves symptoms in more than 90% of the patients who undergo this treatment, and is favored over other surgical intervention such as PTCA[2].

The evidence further states that despite this the patients prefer not to undergo CABG surgery because of the fear of complication, as well as of physical and mental debilitation owing to invasive surgery[2].Presently the annual number of CABG done in India is 60000[3]. Evidence suggests that between 30% and 40% of CABG surgery patients experience a form of psychological depression immediately leading up to and after surgery and at times in 26% of population 3 months after surgery[1, 8.]

The WHO cites a well known association between depression and cardiovascular diseases are the two most debilitating and costly conditions in the public health context and paucity of information on this topic available in our region. Prevalence of depression symptoms in patient after CABG is substantially higher than in general population. In addition depression in patients with CAD may lead to poor outcome after coronary artery bypass graft(CABG) and is also associated with poor QoL,increase morbidity, frequency of hospitalization and mortality [4.]

Quality of life is an increasing critical outcome of mental healthcare and lower quality of life has been associated with mental and physical illness and one example is the high prevalence for depression [5.]

Depression also influence and remains as a significant independent predictor for lack of functional improvement after CABG. It is of interest to identify the factors that influence the ability of CABG to improve patient's health status. Identification of these factors, if modifiable, may support interventions to improve the functional response after CABG [6.]

Physical exercise is an important component of the standard therapy for the patients after a cardiac event.The World Health Organization has defined secondary prevention cardiac rehabilitation (CR) as 'the sum of activities required to favorably influence the underlying cause of the disease as well as best possible physical ,mental and social conditions so that they may, by their own effort, preserve or resume as normal a place as possible in the community (WHO,993.p.3)[7.]

DEFINITIONS:

DEPRESSION

Depression generally involves symptoms such as a feeling of depressed mood, a loss of interest or pleasure in activities, sleep disturbance, fatigueor impaired concentration[2].

QUALITY OF LIFE

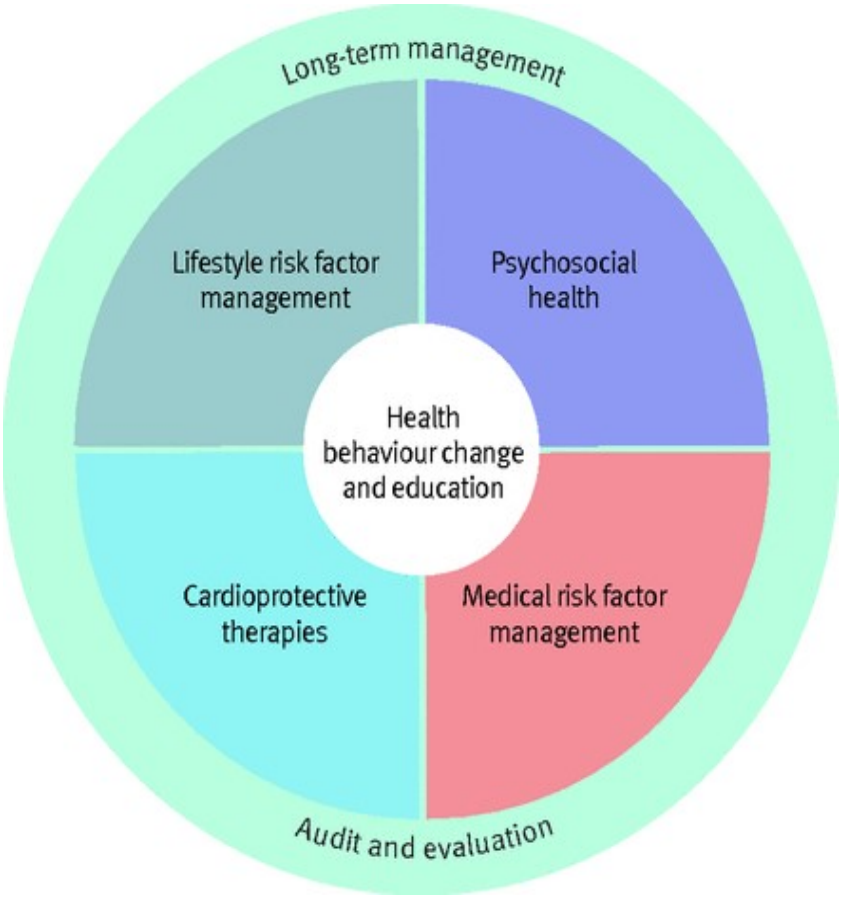
Quality of life comprises of the sense of mental and physical well-being, opportunities for personal development, material status, social relationships, and functioning in the immediate environment[38].

CARDIAC REHABILITATION

The term cardiac rehabilitation refers to coordinated, multifaceted interventions designed to optimize a cardiac patient's physical, psychological, and social functioning, in addition to stabilizing, slowing, or even reversing the progression of the underlying atherosclerotic processes [8.]

Studies have described the short-term benefits of cardiac rehabilitation and exercise training upon depressive symptoms. Specifically, cardiac rehabilitation has been reported to reducedepressive symptoms and the prevalence of depression by 50%-70% [9].

COMPONENTS OF CARDIAC REHABILIATION



International guidelines now recommend that cardiac rehabilitation programmes include health and education and psychological counseling[10].

BENEFITS OF CR

- Mortality
- Reduced hospital admissions
- Improvement in psychological well being and quality of life
- Cardiovascular risk profile[10].

1.2 NEED FOR THE STUDY

The patients who have underwent CABG and discharged from the hospital have shown increased levels of depressive symptoms which have retained a strong and significant trend towards a lower functional status. Previous studies data suggested that depression in cardiac rehabilitations not always treated and is often overlooked, though it can be easily identified, perhaps because it is considered an inevitable reaction to the disease status[6].

The long standing focus on psychosocial factors in CABG patients has highlighted an association with increase risk of morbidity in the short and longer term. When cardiac diseases and depression present together prognosis for both worsen.The review of literature has continually shown that depression is associated with poor QoL and increases morbidity and mortality making the outcomes of the surgery less effective[9].

Since the impact of cardiac rehabilitation on depression and quality of life in patients after CABG is not fully understood. Hence our study aims to analyze the benefits it has on improving the levels of depression and quality of life.

1.3OBJECTIVES OF THE STUDY

- To screen the number of patients depressed after CABG.
- To find out the impact of cardiac rehabilitation on depression and quality of life CABG.
- To find out the correlation between depression and components of quality of life after CABG.

1.4 RESEARCH QUESTIONS

- Do patients have depression after undergoing CABG?
- Does cardiac rehabilitation have any impact of depression and quality of patients who underwent CABG?
- Is there any correlation between depression and components of quality of life after CABG?

1.5 HYPOTHESIS

NULL HYPOTHESIS–'There is no significant difference on the impact of cardiac rehabilitation on depression and quality of life after CABG.

ALTERNATE HYPOTHESIS- 'There is a significant difference on the impact of cardiac rehabilitation on depression and quality of life after CABG.

Review of Literature

CHAPTER 2

2. REVIEW OF LITERARTURE

1. **CarolC.Choo,ID ,PeterK.H.Chew et al (2018)** An inspection of the mean scores indicated that patients reported higher levels of physical and mental quality of life and lower levels of depression post-cardiac rehabilitation.
2. **SusmitaMallik, MD; Harlan M. Krumholz et al(2017)**higher levels of depressive symptoms at the time of CABG are a strong risk factor for lack of functional benefits 6 months after CABG.
3. **LeiliPourafkari, SamadGhaffari et al (2016)** cardiac rehabilitation decreases the level of depression after CABG. These may benefit from this program psychologically and therefore, and therefore may cope well with the new changes in their health conditions.
4. **Karolina Gierlaszyńska, Robert Pudloet al (2016)** Questionnaires are the most popular method of measuring quality of life. On the basis of the literature, we can conclude that the Short-Form Health Survey (SF-36) questionnaire is one of the most widely used tools measuring the quality of life of patients undergoing cardiological treatment and cardiac surgery.
5. **Krzysztof Małyszczak, Joanna Rymaszewska(2015)** mood and anxiety disorders are the important factors that influence the treatment of CVD.
6. **Özlem SOLAK, Fatıma YAMAN et al (2015)**in our cardiopulmonary rehabilitation unit, CRP, comprising endurance exercise using cycle ergo meter, improved the quality of life and functional capacity in patients with CAD and CABG. However, the improvement in depression level was observed only in patients with CAD.
7. **David L. Hare, Samia R. Toukhsati et al(2014)**thereisacausal relationship, depression isthemaindriverofqualityoflifeandrequires prevention, detection, andmanagementinitsown right. Depression afteran acutecardiaceventis commonlyanadjustmentdisorderthancanimprovespontaneouslywith comprehensivecardiacmanagement.
8. **Malinstenman, Martin. J.Holzmann MD, PhD(2014)** strong and significant association between depression and long time survival in patients with heart diseases who underwent CABG.
9. **HenndyGintinga, b, Gérard Näringaet al (2013)**we conclude that the Indo BDI-II is a valid measure of depression, both in the Indonesian general population and in CHD patients.
10. **Yuan-Pang Wang, ClariceGorenstein (2013)** The BDI-II is a relevant psychometric instrument, showing high reliability, capacity to discriminate between depressed and non-depressed subjects, and improved concurrent, content, and structural validity. Based on available psychometric evidence, the BDI-II can be viewed as a cost- effective

questionnaire for measuring the severity of depression, with broad applicability for research and clinical practice worldwide.

11. **David Horne MD, DCH, ScohKehler et al (2013)** depression is prevalent is one –third of the cardiac surgery patients at the time of discharge. It is associated with highest risk of pos operative depression.
12. **FarkhondehShariAlirezaShoul et al (2012)** Cardiac rehabilitation was effective in reducing depression 2 months after surgery in patients undergoing coronary artery bypass grafting.
13. **AlirezaYaghoubi, Jafar-SadeghTabrizi et al (2012)**the results of the studies showed relatively low quality of life of cardiovascular patients in general. Therefore, according to the introduced effective factors in this study, it is necessary to consider regular programs for improving quality of life in these patients and providing suitable and qualitative services.
14. **Luc Noyeza, Marieke J. de Jagera et al (2011)** shows that information about QoL after cardiac surgery is limited, not only because the number of studies is small, but also because the set-up of the studies differs widely.
15. **Dr. Kenneth E. Freedland, PhD, Dr. Judith A. Skala, PhD et al (2009)** Both cognitive behavior therapy and supportive stress management are efficacious for treating depression after coronary artery bypass surgery, relative to usual care. Cognitive behavior therapy had greater and more durable effects than supportive stress management on depression and several secondary psychological outcomes.
16. **Colleen Gorman Koch, MD, MS; Liang Li, PhD et al (2007)** Poor health-related quality of life after recovery from cardiac surgery identifies patients who are at risk for reduced long-term survival.
17. **Richard V.Milani, MD, Carl.J.Lavie MD (2007)** in patients following major coronary, cardiac rehabilitation is associated with both reduction in depressive symptoms and excess mortality associated with it. More over only mild improvement levels of fitness appears to be needed to produce these benefits on depressive symptoms and its associated mortality.
18. **John S. Rumsfeld, MD, PhD, P. Michael Ho, MD et al (2004)**these predictors of health-related quality of life after coronary artery bypass surgery may be useful for preoperative risk assessment and counseling of patients with regard to anticipated health status outcomes. Factors such as current smoking and psychiatric disease may be targets for interventions to improve health- related quality of life outcomes.

Materials and Methodology

CHAPTER 3

3. MATERIALS AND METHODOLOGY

MATERIALS

Following tools were used to evaluate the patient's response.

1. Beck depression inventory questionnaire
2. SF-36 for quality of life questionnaire

METHODOLOGY

The study was conducted on 30 post CABG subjects after 1 month of discharge from the hospital. They were selected based on the selection criteria. Participants were screened by the surgeon before inclusion to the study and a complete cardiac examination was done before referral to rehabilitation. The content of the program were developed and discussed with the team consisting of a cardiologist and a cardiothoracic surgeon.

The purpose and nature of the study were explained to all the participants and there attenders.

3.1STUDY DESIGN

The study design was reviewed and approved by the institutional review board of Sri Ramakrishna College and college of paramedical sciences.

Voluntary written informed consent was obtained from all the participating patientswho were referred by the cardiothoracic surgeon.

3.2 STUDY SETTING

a) **Place of study**- The study was carried out in the department of Cardiothoracic Surgery. Sri Ramakrishna Hospital, Coimbatore under the supervision of the staff and Professor of the college of Physiotherapy, SRIPMS, Coimbatore-641044.

b) **Subjects**- The subjects were 1 month post CABG referred for Cardiac rehabilitation by Cardiothoracic Surgery unitfrom Sri Ramakrishna Hospital, Coimbatore.

3.3STUDY DURATION

The study was conducted over the period of 6 months in Sri Ramakrishna Hospital, Coimbatore.

3.4 SAMPLING METHOD

The subjects used in the study were 1month post CABG and they were evaluated for depression and quality of life and their age range from 30 to 70 years were selected by convenient sampling method.

3.5Sample size- A total of 30 post CABG subjects who fulfilled the inclusion criteria were given the questionnaires and based on the results of the questionnaire patients received the cardiac rehabilitation.

3.6 TREATMENT DURATION

The duration of the treatment procedure is 8 weeks, 2 days per week.

3.7SELECTION CRITERIA

a) INCLUSION CRITERIA

- Either gender patients of age 30years – 70 years[38].
- Ability to perform the exercises in the rehabilitation program.
- Ejection Fraction ratio over 40%[9].
- Able to attend rehabilitation session.[1]

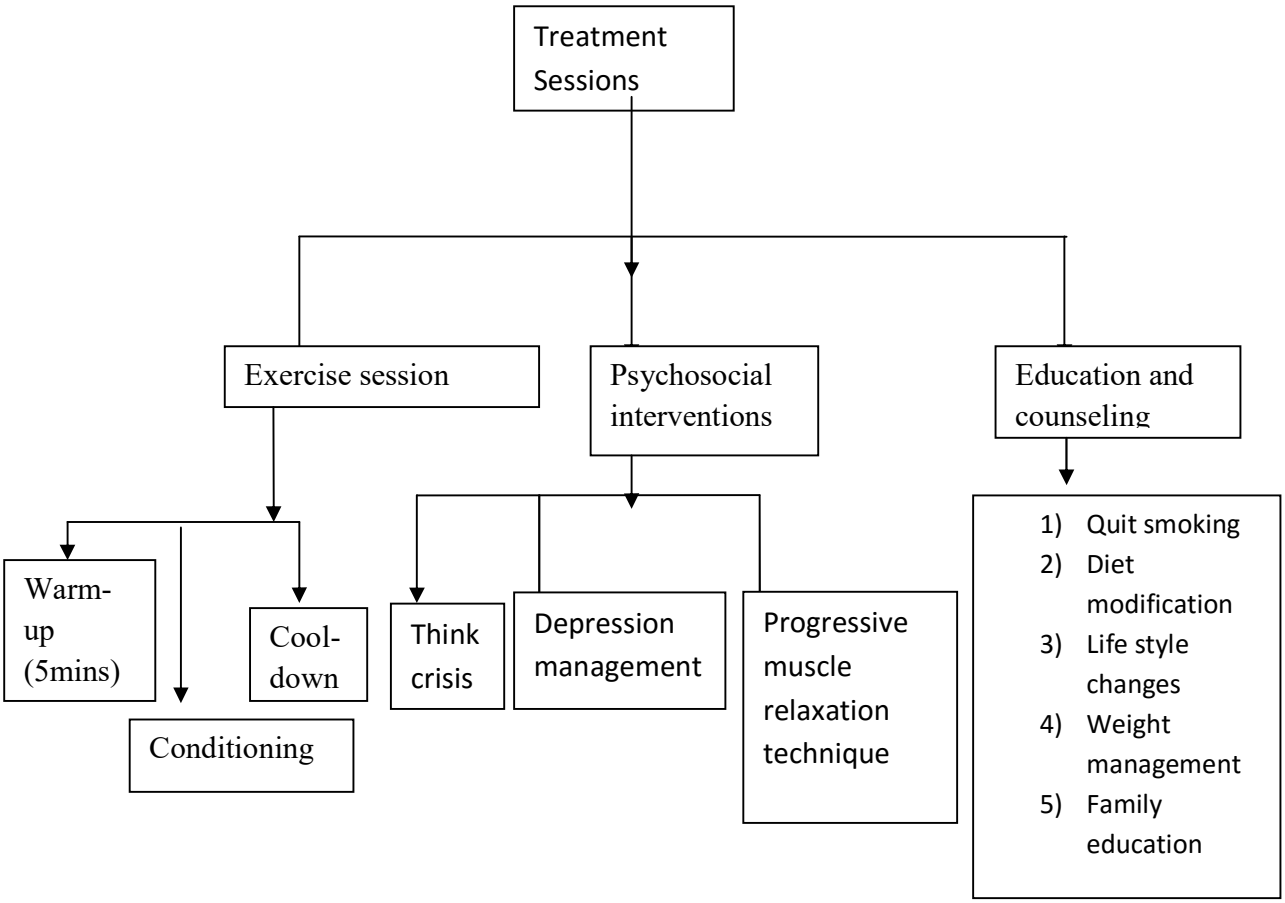
b) EXCLUSION CRITERIA

- Unstable Angina
- History of mental illness.
- Not depressed in the BDI scale (score-0)
- Previous participation in the CR program.
- Recurrence of illness and hospitalization.
- Disorder or disability that interfered with the patient's ability to do rehabilitation.
- History of cardiac surgery.
- Pre- morbid depression and use of antidepressant drugs[1].
- Refusal to participate in the study[9,]

3.8 TREATMENT PROCEDURE

The duration of the rehabilitation lasted for 8 weeks and sessions were held at the Physiotherapy department of Sri Ramakrishna hospital Coimbatore and consisted of exercise program and educational programs 2 sessions were held each week lasting for 2 hours in the form of a group.

The overview treatment session consisted of the following:



1) **Warm Up Phase** - 5mins (gentle stretching of upper and lower limbs, active range of motion exercises)
2)
    - Neck Tilt
    - Side to side neck tilt
    - Chin tuck
    - Hands behind your back and reach
    - Chest stretch
    - Shoulder shrugs
    - Shoulder circles
    - Arm stretches
    - Calf stretches

Fig-1 side to side neck tilts

Fig-2 arm stretches

3) **Conditioning Phase**- 20mins (walking and little strengthening exercises)

- Trunk twists
- Walk on the spot
- Trunk side bending
- Triceps and biceps strengthening with 1L water bottle
- Side arm rise with l L water bottle
- Forward arm raise
- Walking for 5mins

Fig-3 trunk twists.

Fig- 4 front arm rise with water bottle.

Fig-5 side arm rise with bottle.

4) **Cool Down Phase** - 5mins (relaxation exercises, breathing technique, gentle stretches)

- Diaphragmatic breathing
- Deep breathing exercises
- Coordinated breathing
- Gentle stretches and movements
- Low intensity
- Long –hold static stretching.

Fig- 6 gentle stretches and movements.

STRUCTURING PSYHOSOCIAL INTERVENTIONS: SPECIFIC GUIDELINES

1) THINK CRISIS INTERVENTION

Crisis intervention theory can serve as a helpful backdrop to recognizing and treating patient's psychosocial concerns. Crisis theory proposes that patient and their loved ones cope better with a crisis when they are offered a combination of reassurance, advice, and challenge to cope cooperatively together and follow up. Repeated, brief therapeutic contacts that focus on the crises being caused by hospitalization, medical procedures or rehabilitation.

2) MANAGING DEPRESSION

Some common symptoms of depression, such as fatigue and loss of interest in people and activities may interfere with the adherence to CR. These patients require a continuous effort by the team to keep them engaged in the program (e.g. list of strategies to promote adherence in patients enrolled for the rehabilitation).

- Most important, work to establish a good rapport with the patient. Positive feedback and attention from rehabilitation staff can go a long way towards promoting adherence.
- As part of the orientation to cardiac rehabilitation, review with the patients their personal barriers to participate .once the problems identified can find ways to solve the obstacles.
- Educate patients about the health and mood benefits of exercises.
- Many patients benefits from the social support that comes with being involved in the cardiac rehabilitation.
- Assist patients in the development of realistic goals. (Gradual increase in exercise time.)
- Positive reinforcement for exercise is very important

3) PROGRESSIVE MUSCLE RELAXATION

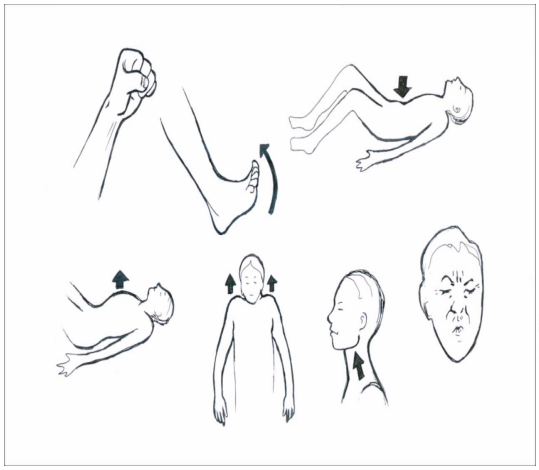
Edmund Jacobson [1938], developed the method of progressive muscle relaxation to teach people to relax the tension in the muscle associated with stress.

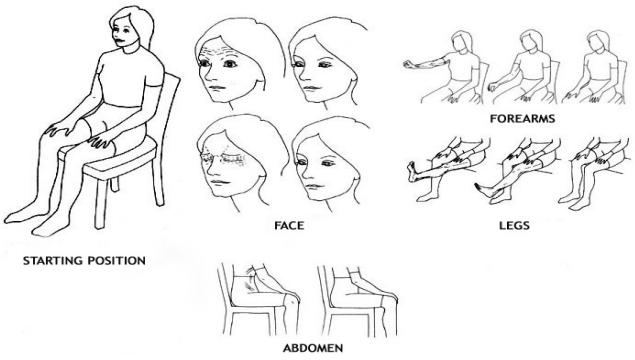
The sequence allows them to

- Develop awareness of their muscle tension.
- Differentiate between feelings of tension and relaxation. This method is progressive because people progress from one muscle group to other.

Teaching progressive muscle relaxation along with breathing technique has reported to have beneficial effects in reducing pain and emotional distress. It is an easy and effective technique for relaxing body and mind. Jacobson's progressive muscle relaxation is a form of relaxation which teaches the patient to tense and relax muscle groups in a logic sequence from head to toe.

Starting positing: lying or sitting





Begin by closing the eyes and clearing the mind, focus on each part of the body creating and releasing the tension from head to toe.

Tense each muscle group for 5 to seconds and then abruptly release the tension for 15 to 20 seconds before tensing the next group of muscles. Each muscles group may be tensed two to three times until relaxed.

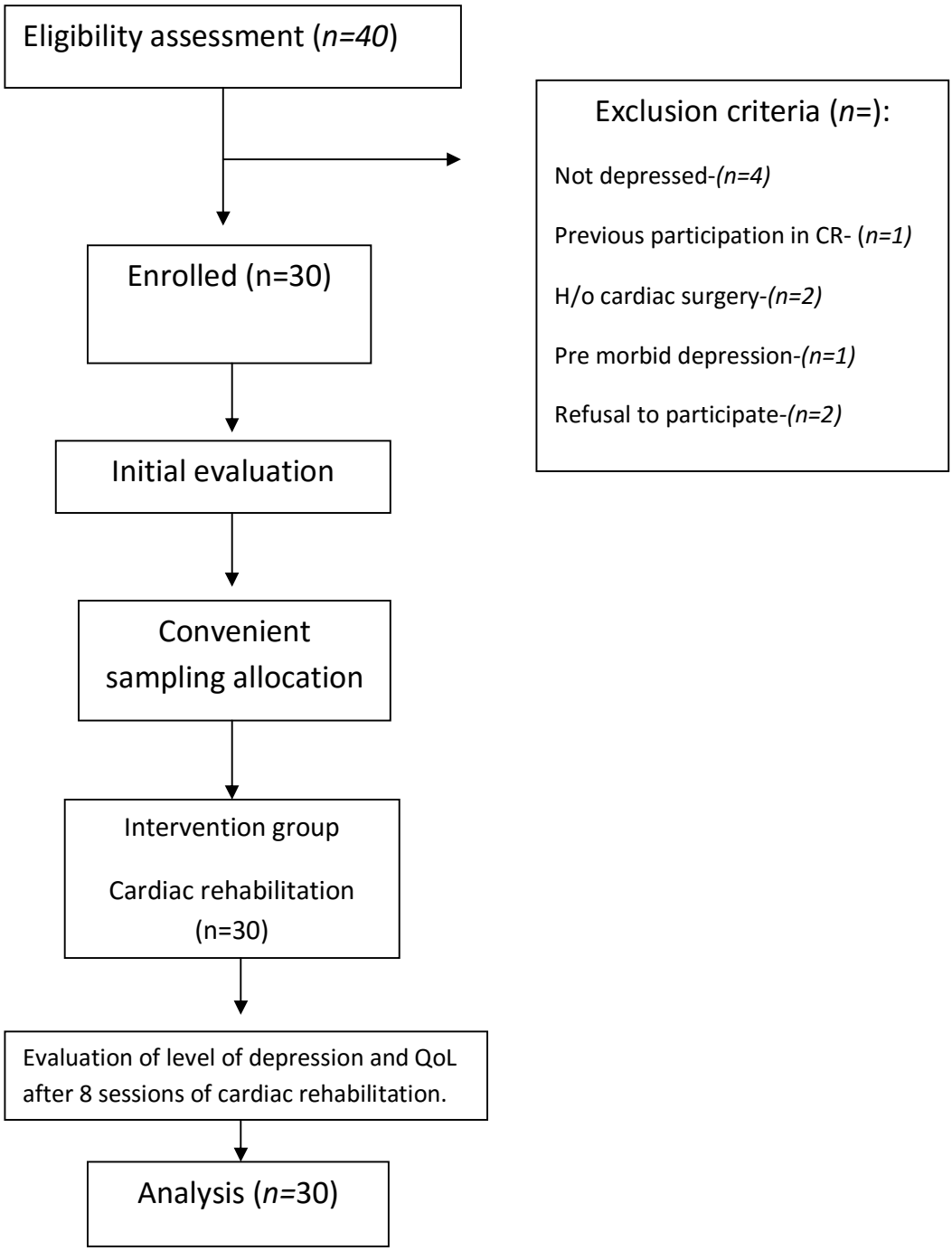
Implementation of Progressive Muscle Relaxation

- **Face** : raise eyebrows ,wrinkle into deep frown, tightly shut the mouth [close jaws firmly],open mouth wide [open jaws]
- **Neck**: press head back into the pillows.
- **Arms**: raise shoulder towards ear [shrug shoulders],brace shoulders back ,bend forearm [flex elbow], straight forearm [extend elbow],bend hand back[extend wrist]bend hand forward [flex wrist]& tighten by making fist [clench the hands]
- **Buttocks**: press the buttocks together tightly.
- **Legs**: press thigh down [extend hip], bend foot facing away from body [plantar flex foot], bend foot facing towards the body [flex toe] & bend toes facing towards the body [extend toes].

Precaution:-

Do not over tight or strain you should not experience pain when you tense your muscles.

3.9 STUDY METHODOLOGY



3.10 VARIABLES

INDEPENDENT VARIABLES:

- Cardiac rehabilitation
    1. Exercise session.
    2. Psychosocial interventions.
    3. Education and counseling.

DEPENDENT VARIABLES:

- Depression.
- Quality of life

3.11 OUTCOME MEASURES:

- Level of depression
- Quality of life.

3.12 ASSESSMENT PARAMETERS

The patient's response for the rehabilitation was evaluated using the following parameters:
1) Beck depression inventory (BDI)
2) Health related quality of life – (Short Form -36)

BECK DEPRESSION INVENTORY

Beck depression inventory (BDI) was used to determine depression level. BDI is a 21-question multiple –choice self reported inventory, one of the most widely used method, for measuring depression severity. When the test is scored, a value of 0-3 is assigned for each answer and then the total score is compared with a key to determine the depression's severity. The standard cut –offs are as follows: 1-10 indicates minimal, 11-16 indicates mild; 17-20 indicates borderline a 21-30 indicates moderate and 31-40 indicates severe[7].

QUALITY OF LIFE

The QoL was assessed using SF-36 this is the most appropriate generic measures HRQoL questionnaire among people with ischemic heart diseases. It comprise of 36 questions grouped in eight separate multi-item scales ,covering the following domains: physical functioning (10 items),role limitation due to physical problems (four items),bodily pain (four items),general health perception (five items),vitality(four items).Majority of the scales are scored on three to six points categorical scales with different anchor points ,whereas the response choices in the role functioning scales are dichotomous (6).The questions were summated and transformed to eight 0-100 with higher scores indicating better HRQoL[7].

3.13 RELIABILTY AND VALIDITY

Beck depression inventory – The findings reveal that the BDI-II is a valid, reliable, and culturally relevant instrument to measure depression in family caregivers of children with chronic diseases[23.]

Health related quality of life (SF-36 FORM)- Short Form –Item Health Survey (SF-36).This established survey instrument, which is validated in the patients with CHD , has recognized validity in CABG patients .A higher score indicated better functioning. Tests of scale-level validity and reliability performed well as all the scales met the required internal consistency criteria. The item-and scale-level statistical analyses supported the validity and reliability of SF-36 for use in India[31].

3.14 STATISTICAL TOOLS

- Mean and standard deviation
- Paired t-test
- Pearson correlation

4. DATA PRESENTATION AND ANALYSIS

- The data were analyzed using SPSS software computer program (version22) for window.

- Descriptive Statistics:
  - Descriptive statistics for the dependent measures, including means and standard deviations, were calculated for the depression and components of quality of life (SF-36).
  - The formula for calculating the **mean** is,

$$\bar{d} = \frac{\sum d}{n}$$

Where,

$\sum d$ = sum of each value

n = total number of subject

- The formula for calculating the **standard deviation** of differences is,

$$SD = \sqrt{\frac{\sum d^2 - n\,\overline{(d)^2}}{n-1}}$$

Where, n-1 is the degree of freedom for testing the hypothesis.

- **Paired t-test**

$$t = \frac{\sum(X_{Pre}-X_{post})}{SE_{dif}}$$

- **Pearson correlation calculated by**:

$$r = \frac{\sum(x-\bar{x})\,(y-\bar{y})}{\sqrt{\sum(x-\bar{x})^2 \sum(y-\bar{y})^2}}$$

Where, r is the Pearson correlation x and y are two variables.

A p level of <0.005 was considered statistically significant.

The various parameters and their values are given below.

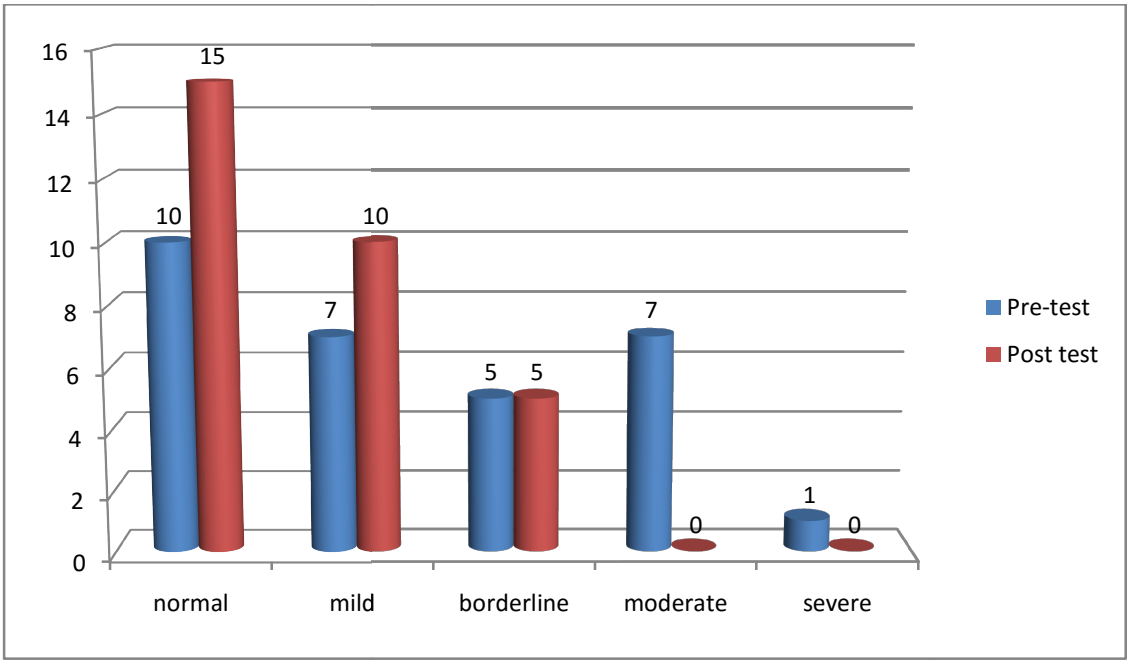
Beck depression inventor

Health related quality of life (SF-36)

Table 1: BECK DEPRESSION INVENTORY

PATIENT NUMBER	PRE-TEST	POST TEST	DIFFERENCE
1	17	10	7
2	22	14	8
3	21	19	2
4	19	10	9
5	31	21	10
6	27	16	11
7	21	15	6
8	29	18	11
9	11	15	4
10	17	16	1
11	10	10	0
12	5	4	1
13	6	5	1
14	5	4	1
15	8	7	1
16	8	6	2
17	3	2	1
18	13	12	1
19	13	11	2
20	12	10	2
21	13	10	3
22	6	5	1
23	4	3	1
24	14	12	2
25	10	10	0
26	26	20	6
27	18	10	8
28	16	14	2
29	19	16	3
30	22	20	2

Graph: 1 showing the severity of depression in Pre-test and Post test after CABG.



Interpretation: Graph: 1 depicts the pre test values indicates that 0-10 (n=10), 11-16 (n=7), 17-20 (n=5), 21-30 (n=7), 31-40 (n=1) and the post test values indicates that 0-10(n=15), 11-16 (n=10), 17-20 (n=5). No patients in moderate and severe depression post cardiac rehabilitation.

TABLE 2: SF-36 PRE-TEST

PHYSICAL FUNCTIONING	ROLE LIMIT DUE TO PHYSICAL FUNCTION	ROLE LIMIT DUE TO EMOTIONAL PROBLEM	EMOTIONAL WELL BEING	SOCIAL FUNCTIONS
17	5	4	18	7
17	5	5	21	6
23	5	7	15	7
19	6	5	19	5
22	6	4	16	4
20	7	7	23	3
20	6	3	23	4
20	4	9	12	7
21	9	8	15	6
20	10	10	18	7
19	5	3	19	5
22	6	5	20	5
17	5	3	17	4
20	5	5	19	4
19	5	6	22	7
21	6	5	18	4
20	7	5	21	5
20	7	7	16	4
20	5	8	20	6
20	7	5	16	4
20	5	4	14	5
22	6	5	21	4
19	5	7	15	6
23	8	8	21	6
20	6	5	10	4
20	6	5	10	4
21	8	7	17	6
20	6	5	10	4
19	5	3	16	4
23	6	4	16	5

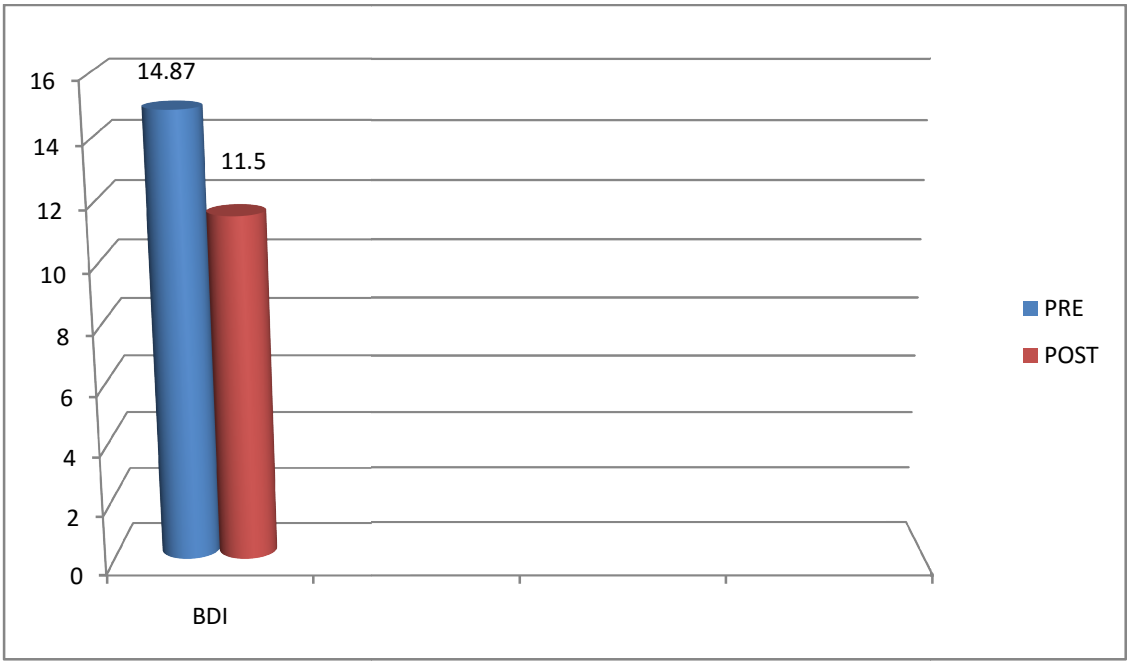
TABLE 3: SF-36 POST TEST

PHYSICAL FUNCTIONING	ROLE LIMIT DUE TO PHYSICAL FUNCTION	ROLE LIMIT DUE TO EMOTIONAL PROBLEM	EMOTIONAL WELL BEING	SOCIAL FUNCTIONS
26	8	5	19	7
29	7	6	20	7
26	8	5	17	6
25	8	4	20	6
25	6	4	19	6
25	8	5	14	6
25	6	5	19	7
25	8	6	16	7
27	7	5	16	7
24	8	6	21	7
26	8	6	20	7
22	7	6	21	7
25	8	5	18	7
23	7	6	20	6
25	8	6	17	6
23	8	6	18	7
26	7	6	15	7
26	6	6	15	7
25	6	5	20	7
25	8	6	20	6
24	8	6	21	7
25	8	6	25	7
24	6	6	15	7
24	8	6	19	7
24	7	5	16	6
27	8	6	18	6
24	6	6	19	6
24	8	6	22	7
25	6	6	18	7
24	7	6	17	7

TABLE 4: Pre – CR and Post- CR BDI values of patients after CABG.

STATISTICS	PRE- CR	POST-CR	P value	t-value
MEAN	14.87	11.50	0.0001	4.9468
STANDARD DEVIATION	7.77	5.44		

Graph 2: Shows the impact of cardiac rehabilitation on depression after CABG.

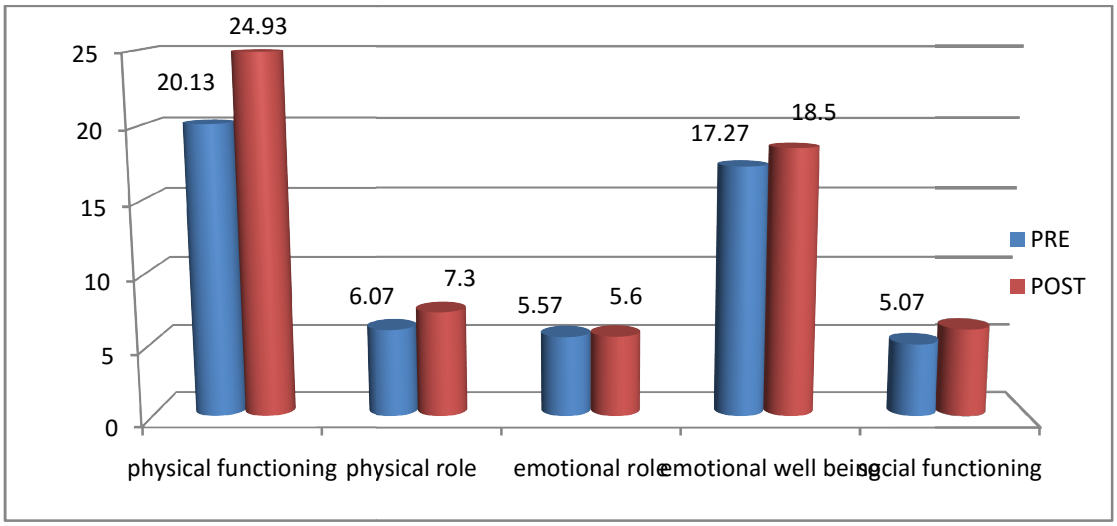


Interpretation- graph 2 depicts that BDI scores have reduced from 14.87 to 11.50 which shows that there is an improvement in depression after CR.

TABLE 5: Pre - CR and Post - SF-36 values of patients after CABG.

COMPONENS	PRE-CR (MEAN ±SD)	POST-CR (MEAN ±SD)	P value	t-value
PHYSICAL FUNCTIONING	20.13±1.59	24.93±1.36	0.0001	10.6478
PHYSICAL ROLE	6.07±1.34	7.30±0.84	0.0002	4.2471
EMOTIONAL ROLE	5.57±1.85	5.60±0.62	0.9235	0.0969
EMOTIONAL WELL BEING	17.27±3.67	18.50±2.43	0.1137	1.6312
SOCIAL FUNCTION	5.07 ±1.20	6.07 ±0.48	> 0.0001	7.1802

Graph 3: shows the impact of cardiac rehabilitation on the QoL after CABG.



Interpretation: graph 3 depicts the improvement in subunits of SF-36 Physical functioning – 20 % to 25%, physical role-6% to 7%, emotional- .3%, social function- 1%.

Graph -4 Pearson correlation

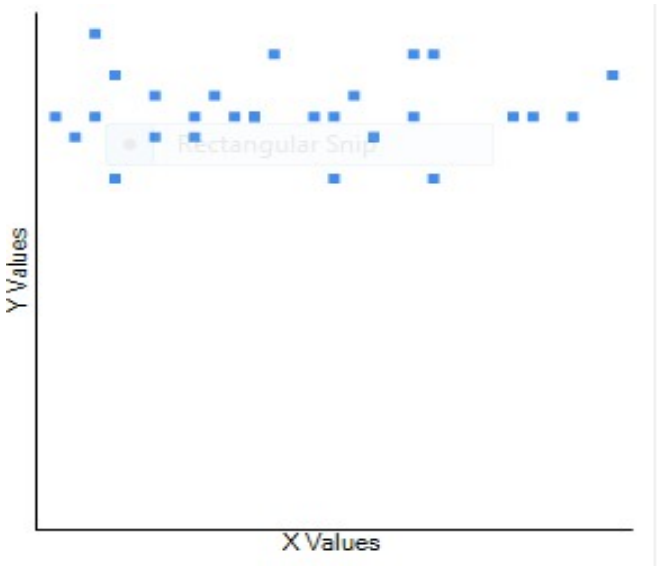


Fig-4 depicts the correlation between depression and QOL shows a positive correlation between the variables but weak p value is not significant at <0.05.

5. RESULTS

We screened out 30 patients after CABG having depression the severity of depression is shown in graph-1.The means and standard deviations of the pre-test and post test are presented in (table 4 and 5).There was a statistically significant decrease in BDI score from 14.87$\pm$7.77 to 11.50 $\pm$ 5.44 after CR in patients 1 month post CABG ($p \leq 0.05$) (table 4). In patients after CABG physical functioning, physical role and social function subunits of SF-36 significantly improved ($p \leq 0.05$) (table 5)**.** An inspection of the mean scores indicated that patients reported improved levels of physical and social functions of quality of life and lower levels of depression in the post- cardiac rehabilitation scores.

We evaluated the correlation between the depression and quality of life components of SF-36 using Pearson correlation (fig-4) where we found the positive correlation between the two but a weak correlation value of Ris 0.0462 the result is (0.82) not significant at p <0.05.

6. DISCUSSION

Cardiac rehabilitation after CABG is designed mainly to improve cardiovascular symptoms. However such programs may also impact mental well being and QoL in patients [38].

According to our study results shows that there was a significant decrease in depression and increase in levels of QoL in patients who have undergone 8 weeks of cardiac rehabilitation after CABG. The mean values of the studies shows reduced scores from 14.87 $\pm$ 7.77 to 11.50 $\pm$ 5.44 in depression and improved scores in components of SF-36 except emotional functioning. The correlation between the two variables showed a weak positive correlation.

Our studies are similar to the following studies where LeiliPourafkari in his article the impact of cardiac rehabilitation program on depression levels in 40 CABG patients after a comprehensive 8 weeks 1 hr 3 times a week program, said that there is a positive correlation between the pre-test and post test(12.1$\pm$ 0.7 to 7.5 $\pm$ 7.7) also the reduced levels of depression in CABG. Where the other researcher in his study says that there is an association between and lower functional status in CABG, rehabilitation have resulted in improved depression and QoL[38,7].

Our result in terms of correlation between the variables with the above article's results is different may be because of the sample size.

The other finding in the above mentioned study also evaluated the clinical effects of CR on depression, the association between depression at entry and subsequent psychiatric, functional and clinical outcomes in which they divided the depressed patient into moderate and severe groups after CR 46 of these patients were no longer depressed. It is similar to our findings also were pretest total of 20 patients were depressed in 4 groups mild, borderline ,moderate and severe after CR reduced to15 [9].

Investigator ÖzlemSolak from turkey in his study improvement in QoL, functional capacity and depression level after CR where 30 patients were of CAD and 10 CABG. Which showed different result from our study where the depression levels in CABG($p=0.344$) after CR did not showed a significant improvement when compared with CAD (4.3$\pm$7.1 to 2.9$\pm$4.3)patients. But all other subunits of SF-36 was significantly improved.($p\leq0.05$)[7.]

The reason of difference in result from our study could be the sample size and non adherence to the CR because of depression.

Sharif et al.observed significant decrease in BDI scores in 80 patients with CABG at the end of an 2 months after 32 weeks it also showed improvement in physical QoL of cardiac rehabilitation exercise program. The study is similar to our finding which states that CR shows

an improvement in QoL and BDI scores.Studies have also investigated whether depressive symptoms also influence the ability of patients to improve functionally after CABG[1].

Stauber et al reported significant improved in the subunits of SF-36 with CABG after 12 weeks of cardiac rehabilitation. And the findings of the patients reported increase post physical QoL and lower depression levels. Behavioral factors such as poor self care continuesmoking, low motivation to change lifestyle and low participation in CR may in part link depression to lower functional status[39].

CR also has an impact on mental well being and QoL in patients SzczepanskaGieracha et al evaluated the efficacy of an early 3 weeks CR regarding the reduction of negative psychological symptoms after CABG in 50 patients. In their study, depression scores before CR were correlated with the scores after the program which is also consistent with our results [40].

The reason for improvement in depression levels may be the physical activity is evident with our studies; similar study also shows that exercise improves the cognitive function and brain plasticity. Hence thereby reducing the levels of depression which in turn improve the QoL also[9.]

In one meta- analysis efficacy of anti-depressants and psychotherapies were used in reduction of depressive symptoms is compared with the CR program the results revealed that CR is superior to antidepressant.[25.]

So, the study not only confirms the association between depression symptoms and functional status but also indicated the depressive symptoms represent a critical factor in predicting outcomes after CABG[20].

Therefore, the rehabilitation program confers a high amount of physical exercise that may be expected to alleviate depressive symptoms and improve the quality of life and vice-verse.

The study shows effectiveness in improving the levels of QOL and depression after CABG.

7. CONCLUSION

Cardiac rehabilitation can be used effective in reducing depression and thereby improving the quality of life after CABG.

8. LIMITATIONS

- Refusal of participants to the cardiac rehabilitation.
- Small sample size.
- Poor referral rates- especially for certain groups such as women, People from ethnic minority group, People in low socioeconomic class.
- Lack of referral from the doctor.
- Poor exercise habits
- Depression
- Transportation
- Poor social support.

9. RECOMMENDATIONS

- Study can be done with a larger group.
- Follow up studies at 6-12 months intervals could explore the sustained effect of cardiac rehabilitation over time.
- Future research could seek patient's consent to interview family members for corroboratory and collateral information.
- Another aspect of cardiac rehabilitation which is thenon adherence to the cardiac rehabilitation program could be further investigated in order to obtained information which could be used to further refine and tailor the program to optimize the adherence.

PATIENTS FEEDBACK

1. PHYSICAL LIMITATIONS

Adjusting to new physical frailties following a cardiac event reported by the patients.

I clean the house over a period of 4 days ….we got our groceries delivered because I can't lift heavy things I'm not supposed to do…I was having physical problems that time.

2. SOCIAL SUPPORT

They [family and friends] have all been very supportive.

3. DEPRESSION AND ANXIETY

I wasnervous going up and down stairs..I get a bit of anxiety once in a while.

Benefits from CR

1. **Motivation –***They gave me motivation and hope.*

   I exercise anyway, but it can act as sort of a way to give me encouragement to behave myself.
   It was a structured way.

DISADVATAGES

1. Distance is too far
2. Session is little big.

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Appendices

APPENDIXS

ASSESSMENT FORM

SUBJECTIVE EXAMINATION

Name: Date of assessment: _____

Age: Gender: IP NO: _____

Date of admission:Marital status:Occupation: _____

Consultant name: _____

HISTORY COLLECTION

Source of history:

Chief complaints:

History of presenting illness:

<u>Past medical history: (WITH DURATION)</u>

CONDITION	DURATION	CONDITION	DURATION
Hypertension		Diabetes mellitus	
Cardiac disease		Hypothyroidism	
Respiratory conditions		Others	

<u>Surgical history/past procedures</u>:

HISTORY OF PROCEDURES	DATE

Current medications:

NAME OF THE MEDICATION	DOSAGE & ROUTE	FREQUENCY

Family history:

HYPERTENSION	DIABETES MELLITUS	CAD	ASTHMA	COPD	CANCER	OTHERS

Occupational history:

Environmental history:

Personal history- History of smoking Yes/no

History of alcohol intake yes/no

Results of recent investigation:

ECG	
ECHO	
CAG	

PHYSICAL EXAMINATION

GENERAL EXAMINATION:

GENERAL APPEARANCE	HEIGHT	WEIGHT	BMI
TEMPERATURE	PULSE	RESPIRATORY RATE	BLOOD PRESSURE
PALLOR	EDEMA	CLUBBING	CYANOSIS

NUTRITIOAL STATUS:Nutrition and hydration

PSYCHOLOGICAL ASSESSMENTS

Anxious/depressed/angry/combative/other

Initial Diagnosis:

Plan of care

Investigations	Treatment

DIAGNOSIS:

BREATHLESSNESS ASSESSMENT

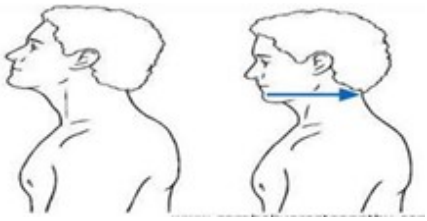
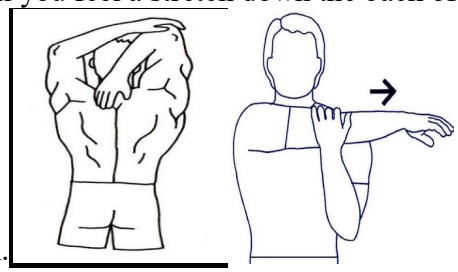
- **Description of onset o Date o Time o Type : sudden/gradual**
- **Severity - How bad it is o How it affects activities of daily living**
- **Frequency o How often**
- **Duration o How long o Constant/intermittent**
- **Course o Better/worse/same**
- **Associated symptoms o Sweating o Cough o Chest discomfort**
- **Aggravating factors o Position/weather/temperature/anxiety/exercise**
- **Reliving factors o Position/hot/cold/rest**
- **During the status of episode o Can you continue to do what you were doing**
  o Do you have to sit down or lie down
  can you speak while working.

RATE OF PERCEIVED EXERTION

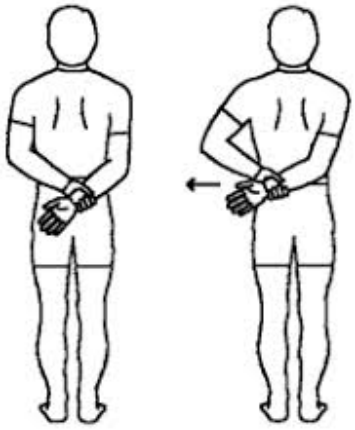
6	**Nothing at all**
7	**Very very light**
9	**Very light**
11	**Light**
12	**Moderate**
13	**Somewhat heavy**
15	**Hard**
16	
17	**Very hard**
18	
19	
20	**Very very hard**

EXERCISE CHART

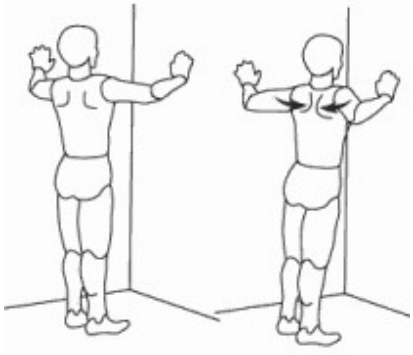
Warm up

1) Neck Tilt: From the sitting position, tilt your head down so your chin touches your chest. Hold this position for 5 seconds. Return to the starting position and repeat. Do this five times. 	**2) Side-to-Side Neck Tilt.** From the same starting position, tilt you neck toward one shoulder leading with your ear. Hold for 5 seconds and then return to the starting position. Do this five times on each side. 
3) Chin tuck-Look straight ahead, and then turn your head to one side, keeping your chin at the same level. Do this five times on each side. 	**4) Arm stretches** -Bend your arm so that your hand is on your shoulder. Slide your hand over your shoulder towards your shoulder blade. With the opposite arm gently push the arm back until you feel a stretch down the back of your arm. 

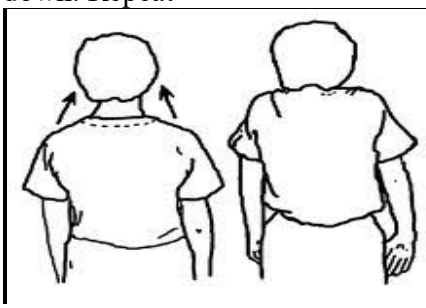
5) Hands behind your back and reach - Grasp your hands together behind the small of your back. Slowly lift your hands off your back. Hold and stretch. Then repeat.



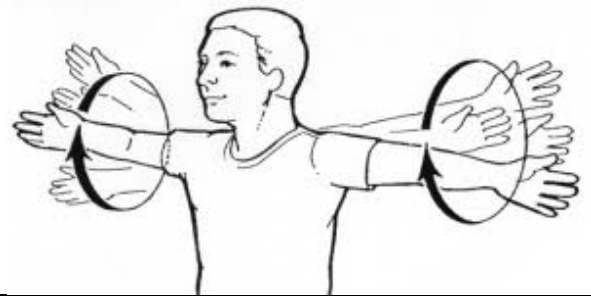
6) Chest Stretch - Place your hands behind your head while sitting upright. Move your elbows back until you feel a stretch, hold. Relax elbows forward to rest, and then repeat.



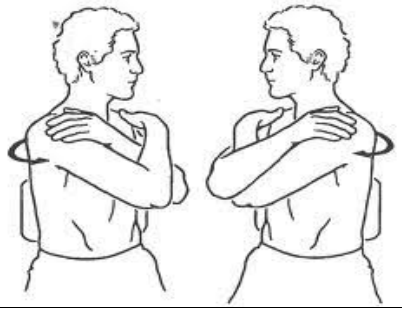
7) Shoulder Shrugs- Bring your shoulders up to your ears, and then relax your shoulders down. Repeat



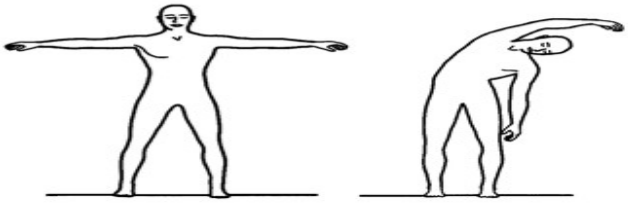
8)Shoulder Circles - Sitting upright, roll your shoulders in a smooth motion up, back and down in a circle. Repeat in the reverse direction.



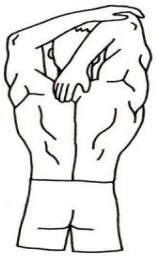
Conditioning phase

1) Coughing and Breathing Exercises: Remember to use your incentive spirometer 10 times per hour when you are awake. You may use a pillow or blanket to hold over your incision when you cough. This will provide support and decrease pain.	**2) Trunk Twists** - Slowly rotate your trunk to the right, looking over your shoulder. Hold and stretch. Then rotate your trunk to the left, hold and stretch. Repeat sequence. 
3) Walk on the spot Toe taps Swing your arms, step your feet. Alternate stepping forwards, tapping your left and right toes.	**4) Forward Arm Raise** - Sitting with upright posture, straighten your arm with your thumb facing up. Raise your arm up to the front over your head. Your elbow should be next to your ear. Repeat with your other arm. 

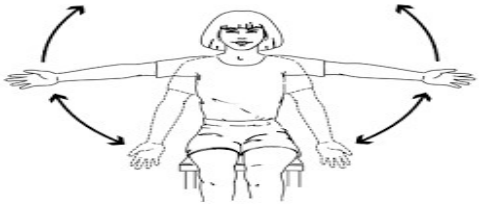
5) Trunk Side bending Hold your arms relaxed at your sides and maintain your trunk upright. Lean to your right side slowly. Hold and stretch. Then lean to your left side, hold and stretch. Repeat sequence.



6)Triceps biceps-

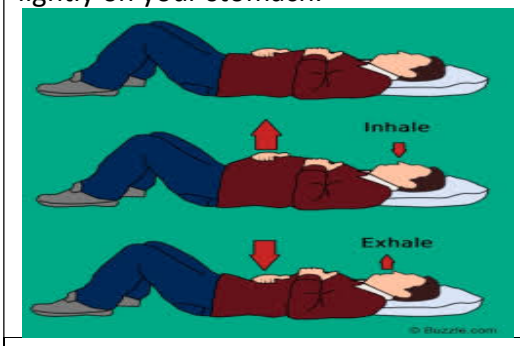
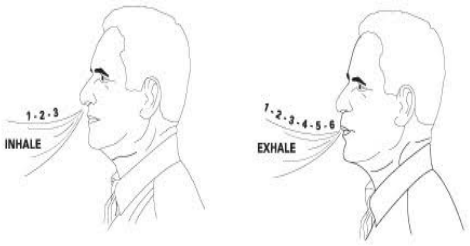
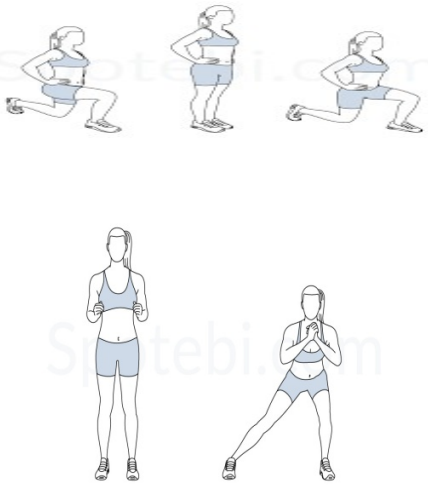


7) Side Arm Raise-Hold your arm straight out to your side with your thumb up. Raise your arm up to the side over your head, hold and stretch. Repeat with your other arm.



8) Calf stretch -Place one foot in front of the other with the front leg bent and the back leg straight. Keep the heel of the back leg on the floor, bend the front knee until you feel a stretch in you calf. Repeat on the other leg.

Cool down

Diaphragmatic breathing- put a hand on your chest and places the other on your stomach. Take a breath, feeling you stomach move outward. Breathe out slowly press lightly on your stomach.  	**Deep breathing exercise**- sit or stand with your elbows slightly back. inhale a deep breath, hold your breath, exhale 
Coordinated breathing-inhale through your nose. Purse your lips breathe out 	Lunges 

EXERCISE SHEET

SATURDAY			
FRIDAY			
THURSDAY			
WEDNESDAY			
TUESDAY			
MONDAY			
DAYS/EXERCISE	**WARM-UP**	**CONDITIONING**	**COOL DOWN**

Beck's Depression Inventory

This depression inventory can be self-scored. The scoring scale is at the end of the questionnaire.

1. **Sadness**

I do not feel sad.
I feel sad
I am sad all the time and I can't snap out of it.
I am so sad and unhappy that I can't stand it.

2. **Pessimism**

I am not particularly discouraged about the future.
I feel discouraged about the future.
I feel I have nothing to look forward to.
I feel the future is hopeless and that things cannot improve.

3. **Past failure**

I do not feel like a failure.
I feel I have failed more than the average person.
As I look back on my life, all I can see is a lot of failures.
I feel I am a complete failure as a person.

4.**Loss of pleasure**

I get as much satisfaction out of things as I used to.
I don't enjoy things the way I used to.
I don't get real satisfaction out of anything anymore.
I am dissatisfied or bored with everything.

5. **Guilty feeling**

I don't feel particularly guilty
I feel guilty a good part of the time.
I feel quite guilty most of the time.
I feel guilty all of the time.

6. **Punishment feeling**

I don't feel I am being punished.
I feel I may be punished.
I expect to be punished.
I feel I am being punished.

7. **Self- dislike**
   I don't feel disappointed in myself.
   I am disappointed in myself.
   I am disgusted with myself.
   I hate myself.

8. **Self- criticalness**
   I don't feel I am any worse than anybody else.
   I am critical of myself for my weaknesses or mistakes.
   I blame myself all the time for my faults.
   I blame myself for everything bad that happens.

9. **Suicidal thoughts or wishes**
   I don't have any thoughts of killing myself.
   I have thoughts of killing myself, but I would not carry them out.
   I would like to kill myself.
   I would kill myself if I had the chance.

10. **Crying**
   I don't cry any more than usual.
   I cry more now than I used to.
   I cry all the time now.
   I used to be able to cry, but now I can't cry even though I want to.

11. **Agitation**
   I am no more irritated by things than I ever was.
   I am slightly more irritated now than usual.
   I am quite annoyed or irritated a good deal of the time.
   I feel irritated all the time.

12. **Loss of interest**
   I have not lost interest in other people.
   I am less interested in other people than I used to be.
   I have lost most of my interest in other people.
   I have lost all of my interest in other people.

13. **Indecisiveness**
   I make decisions about as well as I ever could.
   I put off making decisions more than I used to.
   I have greater difficulty in making decisions more than I used to.
   I can't make decisions at all anymore.

14. **Worthlessness**
   I don't feel that I look any worse than I used to.
   I am worried that I am looking old or unattractive.
   I feel there are permanent changes in my appearance that make me looking unattractive

I believe that I look ugly.

15. **Loss of energy**
I can work about as well as before.
It takes an extra effort to get started at doing something.
I have to push myself very hard to do anything.
I can't do any work at all.

16. **Changes in sleeping pattern**
I can sleep as well as usual.
I don't sleep as well as I used to.
I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
I wake up several hours earlier than I used to and cannot get back to sleep.

17. **Irritability**
I don't get more tired than usual.
I get tired more easily than I used to.
I get tired from doing almost anything.
I am too tired to do anything.

18. **Changes in appetite**
My appetite is no worse than usual.
My appetite is not as good as it used to be.
My appetite is much worse now.
I have no appetite at all anymore.

19. **Concentration difficulty**
I haven't lost much weight, if any, lately.
I have lost more than five pounds.
I have lost more than ten pounds.
I have lost more than fifteen pounds.

20. **Tiredness or fatigue**
I am no more worried about my health than usual.
I am worried about physical problems like aches, pains, upset stomach, or constipation.
I am very worried about physical problems and it's hard to think of much else.
I am so worried about my physical problems that I cannot think of anything else.

21. **Loss of interest in sex**
I have not noticed any recent change in my interest in sex.
I am less interested in sex than I used to be.
I have almost no interest in sex.
I have lost interest in sex completely.

INTERPRETING THE BECK DEPRESSION INVENTORY

Now that you have completed the questionnaire, add up the score for each of the twenty-one questions by counting the number to the right of each question you marked. The highest possible total for the whole test would be sixty-three. This would mean you circled number three on all twenty-one questions. Since the lowest possible score for each question is zero, the lowest possible score for the test would be zero. This would mean you circles zero on each question. You can evaluate your depression according to the Table below.

Total Score_____Levels of Depression

1-10_____These ups and downs are considered normal
11-16_____ Mild mood disturbance
17-20_____Borderline clinical depression
21-30_____Moderate depression
31-40_____Severe depression
Over 40_____Extreme depression

SF-36 QUESTIONNAIRE

Name: _____ Ref. Dr:_____ Date: _____
ID#: _____ Age: _____ Gender: M / F

Please answer the 36 questions of the Health Survey completely, honestly, and without interruptions.

GENERAL HEALTH:

1. In general, would you say your health is?
    - Excellent
    - Very Good
    - Good
    - Fair
    - Poor

2. Compared to one year ago, how would you rate your health in general now?
    - Much better now than one year ago
    - Somewhat better now than one year ago
    - About the same somewhat worse now than one year ago
    - Much worse than one year ag

LIMITATIONS OF ACTIVITIES:

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

3. Vigorous activities,such as running, lifting heavy objects, participating in strenuous sports.
    - Yes, limited a lot
    - Yes, Limited a Little
    - No, Not limited at all

4. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf
   - Yes, Limited a Lot
   - Yes, Limited a Little
   - No, Not Limited at all

5. Lifting or carrying groceries
   - Yes, Limited a Lot
   - Yes, Limited a Little No,
   - Not Limited at all

6. Climbing several flights of stairs
   - Yes, Limited a Lot Yes,
   - Limited a Little No,
   - Not Limited at all

7. Climbing one flight of stairs
   - Yes, Limited a Lot Yes,
   - Limited a Little No,
   - Not Limited at all

8. Bending, kneeling, or stooping
   - Yes, Limited a Lot
   - Yes, Limited a Little
   - No, Not Limited at all

9. Walking more than a mile
   - Yes, Limited a Lot
   - Yes, Limited a Little
   - No, Not Limited at all

10. Walking several blocks
   - Yes, Limited a Lot
   - Yes, Limited a Little
   - No, Not Limited at all

11. Walking one block
   - Yes, Limited a Lot
   - Yes, Limited a Little
   - No, Not Limited at all

12. Bathing or dressing yourself

- Yes, Limited a Lot
- Yes, Limited a Little No,
- Not Limited at all

PHYSICAL HEALTH PROBLEMS:

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

13. Cut down the amount of time you spent on work or other activities
    - Yes
    - No

14. Accomplished less than you would like
    - Yes
    - No

15. Were limited in the kind of work or other activities
    - Yes
    - No

16. Had difficulty performing the work or other activities (for example, it took extra effort)
    - Yes
    - No

EMOTIONAL HEALTH PROBLEMS:

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

17. Cut down the amount of time you spent on work or other activities
    - Yes
    - No

18. Accomplished less than you would like
    - Yes
    - No

19. Didn't do work or other activities as carefully as usual

- Yes
- No

SOCIAL ACTIVITIES:

20. Emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?
    - Not at all
    - Slightly
    - Moderately
    - Severe
    - Very Severe

PAIN:

21. How much bodily pain have you had during the past 4 weeks?
    - None
    - Very Mild
    - Mild
    - Moderate
    - Severe
    - Very Severe

22. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?
    - Not at all
    - A little bit
    - Moderately Quite a bit
    - Extremely

ENERGY AND EMOTIONS:

These questions are about how you feel and how things have been with you during the last 4 weeks. For each question, please give the answer that comes closest to the way you have been feeling.

23. Did you feel full of pep?
    - All of the time
    - Most of the time
    - A good Bit of the Time

- Some of the time
- A little bit of the time
- None of the Time

24. Have you been a very nervous person?
    - All of the time
    - Most of the time
    - A good Bit of the Time
    - Some of the time
    - A little bit of the time None of the Time

25. Have you felt so down in the dumps that nothing could cheer you up?
    - All of the time
    - Most of the time
    - A good Bit of the Time
    - Some of the time
    - A little bit of the time
    - None of the Time

26. Have you felt calm and peaceful?
    - All of the time
    - Most of the time
    - A good Bit of the Time
    - Some of the time
    - A little bit of the time
    - None of the Time

27. Did you have a lot of energy?
    - All of the time
    - Most of the time
    - A good Bit of the Time
    - Some of the time
    - A little bit of the time
    - None of the Time

28. Have you felt downhearted and blue?
    - All of the time
    - Most of the time
    - A good Bit of the Time
    - Some of the time

- A little bit of the time
- None of the Time

29. Did you feel worn out?
    - All of the time
    - Most of the time
    - A good Bit of the Time
    - Some of the time
    - A little bit of the time
    - None of the Time

30. Have you been a happy person?
    - All of the time
    - Most of the time
    - A good Bit of the Time
    - Some of the time
    - A little bit of the time
    - None of the Time

31. Did you feel tired?
    - All of the time
    - Most of the time
    - A good Bit of the Time
    - Some of the time
    - A little bit of the time
    - None of the Time

SOCIAL ACTIVITIES:

32.During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?
- All of the time
- Most of the time
- Some of the time
- A little bit of the time
- None of the Time

GENERAL HEALTH:

How true or false is each of the following statements for you?

33. I seem to get sick a little easier than other people
    - Definitely true
    - Mostly true
    - Don't know
    - Mostly false
    - Definitely false

34. I am as healthy as anybody I know
    - Definitely true
    - Mostly true
    - Don't know
    - Mostly false
    - Definitely false

35. I expect my health to get worse
    - Definitely true
    - Mostly true
    - Don't know
    - Mostly false
    - Definitely false

36. My health is excellent
    - Definitely true
    - Mostly true
    - Don't know
    - Mostly false
    - Definitely false

CONSENT FORM

I,Mrs/Mr._____ voluntarily agree to participate in the research study conducted entitled **"Impact of Outpatient Cardiac Rehabilitation Program for Depression and Quality of life after CABG** " which is being conducted at Department of cardiothoracic surgery, Sri Ramakrishna Hospital, Coimbatore.

I understand that the study involves measurement of level of depression that takes place after the surgery and cardiac rehabilitation exercise that could improve the quality of life.

I acknowledge that:

- I have received an adequate explanation of possible risks and inconveniences that may arise from participation in this study.
- I have received a copy and read fully the written information concerning the study, and any questions have been answered to my satisfaction.
- I understand that all the information I provide will be identified by code only.
- I understand that the information I provide will be kept on secured premises and will be available to the study investigator only except at my request or on my authorization.
- I understand that I am free to withdraw my consent at any time during the study and that the information which has been collected will not be used in this case.

PARTICULARS	NAME	SIGNATURE	DATE	TIME
PATIENT				
REPRESENTATIVE/ RELATIONSHIP				

INVESTIGATOR				

Cardiac Rehabilitation
Physician Referral Form

Patient Information **Date:-**

Patient Name AgeGender- M/F Hospital No _____

Referred Doctor- _____

Address- _____ **Phone Number-** _____

Language –English/Tamil

Referral Diagnosis	**Date**	**Hospital**	**Comments**
• **MI**			
• **CABG**			
• **Angina Pectoralis**			
• **Others**			

☐ **have examined the patient listed above and determined that his/her admission into the Cardiac Rehabilitation Program is medically necessary.**

RECOMMENDATIONS:
(Cardiac rehabilitation exercise prescription can be provided)

_____

Referring Physician Information

Name- _____

Telephone Number- Fax Email _____

Physician signature

☐ **Family Practice** ☐**Cardiology** ☐ **Cardiothoracic surgeon**

HOME EXERCISE PROGRAM

NAME: **MONTH:**

Date	Exercise performed and duration	Complaints

College of Physiotherapy,
Sri Ramakrishna Institute of Paramedical Science
Coimbatore-641044

From:

Radhika P K
MPT cardio (2nd year)
College of Physiotherapy, SRIPMS
Coimbatore-641044

To:

The Dean
Sri Ramakrishna Hospital
Coimbatore-641044

Through The Principal, College of Physiotherapy

Respected Sir,

Sub: Request for permission to utilize the Hospital facilities to carry out my MPT dissertation.

I am currently pursuing my 2nd year MPT Cardio, at the **College Of Physiotherapy, SRIPM., Coimbatore**, would like to inform your good self that as per the guidelines laid down by **The Tamil Nadu Dr. M.G.R.MEDICAL UNIVERSITY Chennai,** we are required to submit a project work based on our field of specialization.
In this regard, we have proposed to carry out a dissertation entitled **"Impact of Out-Patient Cardiac Rehabilitation program on Depression , Functional Capacity and Quality of life after CABG",** under the guidance of **Professor T.S. Muthukumar, MPT Cardio-respiratory,** Department of Physiotherapy, College of Physiotherapy, SRIPM Coimbatore.

We have also enclosed herewith the protocol of the proposed project work for your kind perusal. We would be greatly obliged if you could grant us permission to utilize the hospital facilities to carry out my project work.

Expecting your permission in this regard.

Thanking you,
Yours sincerely,
Radhika PK

31/07/18
Signature of the guide

Signature of the principal
Prof. B. Sankarmani, MPT.,MBA
Principal
College of Physiotherapy
Sri Ramakrishna Institute of Paramedical Sciences
395, Sarojini Naidu Road, Siddhapudur
Coimbatore - 641 044.

Permitted

31/7/18
Dean

College of physiotherapy,

Sri Ramakrishna Institute of Paramedical Sciences

Coimbatore-641044

From
RADHIKA PK
MPT 2nd year (cardio-pulmonary)
Sri Ramakrishna institute of paramedical sciences
Coimbatore-641044

To
Dr.S Thiagarajamurthy MS,FRCS(glas),FRCS(Cardiothoracic surgery)
Sri Ramakrishna hospital
Coimbatore-641044

Through The Principal
College of physiotherapy
Coimbatore-641044
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Hence ,I here with enclose the proposal of the dissertation entitled "**Impact of out-patient cardiac rehabilitation on depression and quality of life after CABG**"under the guidance of Professor T.S. Muthukumar, MPT Cardio-respiratory, Department of Physiotherapy ,College of Physiotherapy,SRIPMS Coimbatore for your kind perusal. In this regard, I would be greatly obliged if you could grant me permission to utilize the hospital facilities to carry out my dissertation work. Expecting your permission in this regard.

Thanking you,
Yours sincerely
Radhika PK

Date- 31 July 2018

Place- Coimbatore

31/07/18
Signature of the guide

signature of the principal

Prof. B. Sankarmani, MPT.,MBA
Principal
College of Physiotherapy
Sri Ramakrishna Institute of Paramedical Sciences
395, Sarojini Naidu Road, Siddhapudur
Coimbatore - 641 044.

Permitted
31/7/18

Permitted

Dr. S. Thiagarajamurthy
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SmallSEOTools

PLAGIARISM SCAN REPORT

Words	654	Date	January 04,2019
Characters	4455	Exclude Url	

19%	81%	5	21
Plagiarism	Unique	Plagiarized Sentences	Unique Sentences

Content Checked For Plagiarism

Cardiovascular diseases are the most common cause of mortality worldwide, and coronary artery diseases are the most common among all cardiovascular illnesses. They accounted for 50% of deaths in developed countries and each year many people die due to lack of treatment or suffer from related chronic disabilities 1. Coronary artery disease causes arterial stenosis, compromises blood circulation to the myocardium, and leads to ischemia and infarction because of the build-up of unnatural lipid, fat and fiber in the vessel wall. Treatment methods for coronary artery disease consist of angioplasty, drug therapy, stenting, atherectomy and surgical treatments such as coronary artery bypass graft (CABG) surgery 1. Coronary artery bypass graft surgery (CABG) has been identified as an important surgical tool in the treatment of CAD and has been used for nearly 50 years. CABG surgery substantially improves symptoms in more than 90% of the patients who undergo this treatment, and is favored over other surgical intervention such as PTCA2. The evidence further states that despite this the patients prefer not to undergo CABG surgery because of the fear of complication, as well as of physical and mental debilitation owing to invasive surgery2. Presently the annual number of CABG done in India is 600003. Evidence suggests that between 30% and 40% of CABG surgery patients experience a form of psychological depression immediately leading up to and after surgery and at times in 26% of population 3 months after surgery1, 8. The WHO cites a well known association between depression and cardiovascular diseases are the two most debilitating and costly conditions in the public health context and paucity of information on this topic available in our region. Prevalence of depression symptoms in patient after CABG is substantially higher than in general population. In addition depression in patients with CAD may lead to poor outcome after coronary artery bypass graft (CABG) and is also associated with poor QoL, increase morbidity, frequency of hospitalization and mortality 4. Quality of life is an increasing critical outcome of mental healthcare and lower quality of life has been associated with mental and physical illness and one example is the